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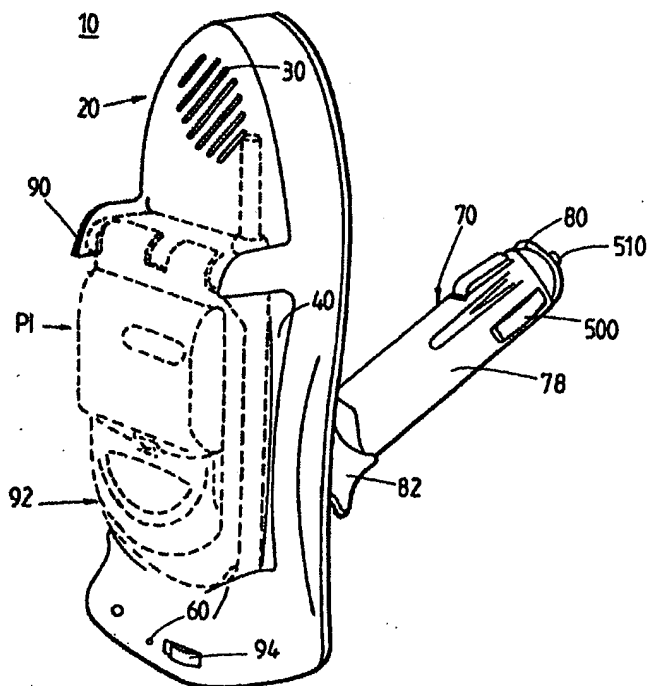
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Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: DEVICE FOR SAFE USE OF A PORTABLE CELLULAR TELEPHONE WHILE DRIVING

(57) Abstract

The present invention relates to an apparatus for permitting the hands-free use of a cellular telephone while driving a vehicle, which apparatus comprises a main body (20) for receiving the cellular telephone comprising a telephone cradle (40), a microphone (60) and a speaker (30), a supporting member (70) for supporting the apparatus, the supporting member comprising a first end (72) affixed to the main body (20) and a second end (76) comprising a cigarette lighter adapter (80), allowing for a power supply to the main body (20) through the supporting member when plugged into a fitting for a cigarette lighter in a vehicle; and securing means (90-92) for securing the telephone to the telephone cradle (40).



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Device for safe use of a portable cellular telephone while driving

The present invention relates to the cellular telephone industry in general, and in particular to a device for permitting the hands-free use of a cellular telephone while driving a vehicle.

5 Conventional cellular telephones have become extremely popular and indispensable communication tools for people who are constantly "on the go". While technology exists to permanently mount cellular telephones in vehicles, permitting users to utilize such devices while driving, most cellular telephone users use them, or at least need
10 access to them, in locations other than their vehicles. Thus, the cellular telephone of choice to most users is a "portable" cellular telephone. Portable cellular telephones are primarily battery-operated, although technology exists to operate the telephone and/or charge the telephone's battery by connecting the telephone and battery to a power supply, such
15 as a vehicle's cigarette lighter.

 In the setting of a vehicle, however, portable cellular telephones are cumbersome, and potentially dangerous. If the telephone is picked up during driving, only one hand remains for steering the vehicle. Often, in an effort to remain "hands-free", drivers support the telephone
20 between the shoulder and the neck. Such a positioning however tends to increase the possibility of accidents, as the driver's top priority should be operating the vehicle and the effort to use the cellular telephone in a "hands-free" manner may pose additional dangers to the driver. In fact, certain jurisdictions throughout the world have proposed and/or enacted
25 legislation prohibiting the use of cellular telephones in vehicles, to the extent that such use affects the driver's operation of the vehicle.

One possible manner in which to avoid the dangers of operating a vehicle while using a cellular telephone is to provide the vehicle with an accessory for receiving the cellular telephone. As the portable telephone's microphone and speaker are linked to the same elements within the hands-free accessory, the cellular telephone is converted into a truly hands-free device.

Previous efforts to provide a hands-free apparatus for use of a cellular telephone while driving a vehicle have been described in U.S. Patent No. 5,471,530 to Chen ('530 patent); U.S. Patent No. 5,490,213 to Huang ('213 patent); U.S. Patent No. 5,613,222 to Guenther ('222 patent); U.S. Patent No. 5,779,205 to Ching ('205 patent); and U.S. Patent No. 5,797,088 to Stamegna ('088 patent), each of which is incorporated herein by reference.

The '530 patent describes a rack securing a cellular telephone to a window of an automobile which adjustable to fit to the mouth of a driver so as to permit a driver of a vehicle to operate a cellular telephone in a hands-free manner. The securing rack includes a mounting base having a vertical portion and a horizontal portion, a clamping board which is adjustably associated with the mounting base and engaged with a speaker and a battery box, and a securing piece removably fixed to a telephone retaining seat having a voice pick-up. A cellular telephone is held by a spring biased clamping member of the retaining seat with the voice pick-up that is electrically connected to the speaker.

In the '213 patent an apparatus is described, which comprises a wireless microphone transmitter to be disposed in the passenger room of a vehicle, a main terminal with a terminal housing comprising a loudspeaker and one end adapted to be inserted into a cigarette lighter socket, and a telephone connector adapted to be electrically connected to a mobile telephone unit via an electrical cable.

The '222 patent describes a headset for use with a cellular telephone. The headset comprises an acoustical earpiece

assembly, a device for mounting the earpiece assembly on the head, in a position adjacent an ear of a person wearing the headset, and a flexible acoustical receiving tube having an upper end connected to the earpiece and a lower end attached to an acoustical receiving cup. The headset also
5 includes a device for releasably attaching the acoustical receiving cup to a telephone in a position where the mouth of the cup is disposed closely adjacent the telephone speaker for receiving sound emitting from the speaker.

The '205 patent describes an extensible windshield
10 portable holder, capable of firmly attaching to the front windshield and extending to a desired handy position to the driver. The windshield portable holder comprises an extensible holder arrangement, which includes a supporter, a sucking device for firmly attaching to a predetermined position of a windshield, an extending device, and a
15 telephone holder mounted on the supporter and adapted to hold a portable telephone thereon.

The '088 patent describes a vehicular audio/cellular telephone system including a vehicular audio system and cellular telephone. In a first embodiment of this invention, the vehicular audio
20 system includes an AM/FM radio, cassette player, CD player or combinations of these, integrates a detachable cellular telephone including a transceiver, rechargeable battery, and small non-directional antenna. When integrated into the vehicular audio system, the cellular telephone uses the vehicle's power and external antenna.

25 In WO 94/22234 a device is disclosed with which a mobile telephone, to be used as a hands-free telephone, can be removably embarked in a car. Thereto, the device comprises a support for the mobile phone. The support is provided with an adhesive, for example an adhesive strip or a hook tape with which the device can be attached to
30 the dashboard. Into the support a microphone is incorporated, which is automatically activated when the mobile phone is inserted in the support,

as well as a loud-speaker and the required and electronic circuits which allow the battery of the mobile phone to be charged. An electric connection with the cigarette lighter of the car can be established by inserting into the cigarette lighter a connector, which is connected to the support through a
5 cable. The cable allows a simultaneous feeding of the phone and charging of its battery.

In GB-A-2.258.786 and US-A-5.414.770 a mobile telephone rack assembly is disclosed comprising a rack body for holding the mobile phone, which is supplemented with a socket for lighting
10 cigarettes. The rack assembly is supported by a support rod, hingedly connected to a plug rod. The plug rod is provided to be inserted into the cigarette lighter of the vehicle, so as to allow the rack assembly to be fixed to the car's dashboard and to allow the rack's cigarette lighter to be electrically connected to the car's cigarette lighter. Thereto, an electric
15 cable is provided which connects the plug rod with the rack's cigarette lighter.

None of the devices mentioned above describe an apparatus which permits the hands-free use of a cellular telephone while driving a vehicle, which is compact, easy to use, removably attachable for
20 use in any vehicle and which does not contain any external electric cables for ensuring electric connection between the car's cigarette lighter and the telephone carrying apparatus.

Consequently, there is a need in the art for a lightweight, easy to install apparatus, which permits the hands-free use of
25 cellular telephone while driving a vehicle, which is removably attachable for use in any vehicle and does not contain any external electric cables.

It is an object of this invention is to provide an apparatus which is removably attachable for use in any vehicle and is capable of ensuring an electric connection with the car's cigarette lighter,
30 without thereto containing any external electric cable.

This is achieved by the present invention in that the

supporting member comprises a first end affixed to the main body and a second end comprising a cigarette lighter adapter. The cigarette lighter adapter allows that the apparatus can be installed in a simple manner by plugging it into the vehicle's fitting for a cigarette lighter, and that it can be
5 removably mounted into the vehicle. Plugging of the apparatus's adapter into the vehicle's fitting for the cigarette lighter also allows for a power supply from the vehicle's cigarette lighter to the main body of the apparatus through the supporting member, so that the use of external cables becomes superfluous. Since cigarette lighters of approximately all
10 vehicles tend to be similar, the apparatus is suitable for use in a large variety of vehicles. Furthermore, the apparatus comprises securing means for securing the cellular telephone to the telephone cradle so as to permit the cellular telephone to be used in a hands-free manner.

Such an apparatus, wherein the supporting member
15 simultaneously functions as a mounting member allowing a removable mounting of the apparatus into a wide variety of vehicles and a power supply from the vehicle towards the apparatus, without necessitating the presence of external cables is nowhere described or taught in the prior art.

According to a first preferred embodiment of this
20 invention, the main body, more particularly the telephone cradle comprises a charging unit for the cellular telephone. In that way, an apparatus is provided which permits the hands-free use of a cellular telephone while driving a vehicle and simultaneously charging the telephone battery. The charging unit preferably comprises a safety mechanism to preclude a
25 cellular telephone battery from over charging, thus causing damage to the cellular telephone battery or cellular telephone. Once the cellular telephone battery is fully charged the safety mechanism is triggered to prevent further charging of the cellular telephone battery. The securing means comprises a pair of opposite extruding arms affixed to the main
30 body and a seat for receiving the telephone.

According to a second preferred embodiment of the

invention, the main body comprises a microphone and a speaker and connecting means for establishing an electrical connection between the microphone and the speaker on the one hand and the telephone placed into the apparatus on the other hand. Thereby means are provided for
5 transmitting signals received by the microphone to the cellular telephone, and signals received by the telephone to the speaker. The apparatus is preferably also provided with means for amplifying the signals. Such an apparatus is not only accessible to the person seated in close proximity of the cigarette lighter, but also to other passengers, possible seated in the
10 back of the vehicle, and allows a real hands-free use of the cellular phone.

Optionally, an extension member one end of which is removably attached to the second end of the supporting member, and an opposite end of which comprises a cigarette lighter adapter for plugging into a cigarette lighter of the vehicle for a connection of a power supply to
15 the main body, may be used for extending the supporting member of the apparatus.

With the above described features, a unitary lightweight, small and cordless apparatus is provided which permits the hands-free use of a cellular telephone while driving a vehicle, which cannot
20 be visually observed from outside of the vehicle and is aesthetically pleasing to the eye.

In another particular embodiment a voice recognition system for automatic use of the telephone may be incorporated as a safety provision.

25 Other particular aspects of the present invention are formulated in the appended sub-claims.

There are various aspects of the present invention which allows the cordless apparatus to be used with various types and models of cellular telephones.

30 These and other objects, features, and advantages of the present invention may be better understood and appreciated from

the following detailed description of preferred embodiments thereof, selected for purposes of illustration and shown in the accompanying drawings.

5 The foregoing and other objects, advantages and features of the invention, and the manner in which the same are accomplished, will become more readily apparent upon consideration of the following detailed description of the invention and preferred embodiments thereof taken in conjunction with the accompanying drawings which illustrate preferred and exemplary embodiments, and
10 wherein:

Fig. 1 is a perspective view of first aspect of the cordless apparatus, for use with a MOTOROLA® StarTac cellular telephone P1, permitting the hands-free use of a cellular telephone while driving a vehicle, in accordance with the present invention;

15 Fig. 2(a) is a front view of the main body of the first aspect of the cordless apparatus permitting the hands-free use of a cellular telephone while driving a vehicle, in accordance with the present invention;

Fig. 2(b) is a back view of the main body of the first aspect of the cordless apparatus permitting the hands-free use of a cellular telephone while driving a vehicle, in accordance with the present invention;
20

Fig. 3(a) is a top view of the main body of the first aspect of the cordless apparatus permitting the hands-free use of a cellular telephone while driving a vehicle, in accordance with the present invention;

Fig. 3(b) is a side view of the main body of the first aspect of the cordless apparatus permitting the hands-free use of a cellular telephone while driving a vehicle, in accordance with the present invention;
25

Fig. 4 is a perspective view of the extension member;

Fig. 5 is a perspective view of a second aspect, for use with a NOKIA® cellular telephone, of the cordless apparatus permitting the hands-free use of a cellular telephone while driving a vehicle, in accordance with the present invention;
30

Fig. 6(a) is a front view of the second aspect of the cordless apparatus (without the NOKIA® telephone) permitting the hands-free use of a cellular telephone while driving, in accordance with the present invention;

5 Fig. 6(b) is a back view of the second aspect of the cordless apparatus (without the NOKIA® telephone) permitting the hands-free use of a cellular telephone while driving, in accordance with the present invention;

10 Fig. 7 is a perspective view of a third aspect, for use with an ERICSSON® DF388vi cellular telephone, of the cordless apparatus permitting the hands-free use of a cellular telephone while driving a vehicle, in accordance with the present invention;

15 Fig. 8 is a perspective view of a fourth aspect of the cordless apparatus, for use with a MOTOROLA® cellular telephone, permitting the hands-free use of a cellular telephone while driving a vehicle, in accordance with the present invention;

20 Fig. 9 is a perspective view of a fifth aspect of the cordless apparatus, for use with an ERICSSON® AF778 cellular telephone, permitting the hands-free use of a cellular telephone while driving a vehicle, in accordance with the present invention.

Referring now to the drawings, Fig. 1 illustrates a possible embodiment of a cordless apparatus of this invention, which permits a hands-free use of a cellular telephone (generally designated 10) while driving a vehicle. The cordless apparatus shown in figure 1 comprises a main body 20, a supporting member 70 attached to the main body 20 of the apparatus and means 90 for securing the telephone to the telephone cradle 40. The securing means for securing the telephone 10 to the telephone cradle 40 comprises a set of opposite extruding arms 90 and a seat 92 for receiving the telephone 10. The main body 20 includes a speaker 30, a telephone cradle 40 with a charging unit 50 (shown in Fig. 3(a)), and a microphone 60.

25
30

The charging unit 50, comprises a safety mechanism which prohibits a cellular telephone battery from overcharging, which would involve a blow out or other damage to the cellular telephone 10. Once the cellular telephone battery is charged, the safety mechanism is activated to prohibit further charging of the battery. The charging current is preferable approximately 500mAh. The maximum speaker power is preferably approximately 0,5 Watts. The speaker impedance is preferably approximately 16 ohms.

As shown in Figs. 1 and 3(b), the supporting member 70 may comprise at a first end 72, a pivot hold 74 affixed to the main body 20. The pivot hold 74 comprises an adjustable turning knob 82 for adjusting the angular position (\emptyset) of the tubular housing part 78 between 0 and 180 degrees from the main body 20. The supporting member 70 may comprise at a second end 76, a tubular housing part 78 with a cigarette lighter adapter 80 for plugging the apparatus into a cigarette lighter of the vehicle for a connection of a power supply (P), approximately, 0,1 W of consumption power, to the main body 20, namely the speaker 30, the charging unit 50 and microphone 60. The input voltage is preferably approximately 12-24 Volts DC.

As is shown in Fig. 4, the present invention includes the optional use of a removably attachable extension member 100 for the supporting member 70. The extension member 100 comprises (a) a socket member 110 and (b) a cigarette lighter adapter member 120 which are pivotally connected to each other through a pivot hold 112. The pivot hold comprises a turning knob 114 for adjusting the angular position \emptyset of the adapter member 120 between 0 and 180 degrees from the socket member 110. The socket member 110 is formed similar to a cigarette lighter socket into which the second end 76 of the supporting member 70 of the main body 20, the cigarette lighter adapter 80, is plugged. Thus, the plugging of the second end 76 of the supporting member 70 of the main body 20 into the socket member 110 of the extension member 100, provides a longer

and extending supporting unit. Such an extended supporting unit is especially useful in vehicles with protruding dashboards or to enable a user of the apparatus to customize the positioning of the apparatus to suit a user's own personal needs. The adapter member 120 of the extension member 100, is similar to the cigarette lighter adapter 80 of the supporting member 70, as it is intended to be plugged into the cigarette lighter of the vehicle, to connect the power supply (P) to the main body via the supporting member 70.

As shown in Figs. 1 and 4, the tubular housing part of the cigarette adapter 78 of the supporting member 70 and the adapter member 120 of the extension member 100 comprise a set of first and a set of second electrical contacts 500, 510 and 520, 530, respectively. The first electrical contacts serve to connect electrically the components of the main body 20 to a car battery (B) via the vehicle's cigarette lighter socket, thus permitting the supply of the electric power (P) to the different components of the main body 20. The electrical contacts include a plurality of first electrical contacts formed as a plurality of curved strips that are secured to the tubular housing part of the cigarette adapter 78 and the adapter member 120 of the extension member, 500, 520 and a second electrical contact that is disposed axially in the tubular housing part of the cigarette lighter adapter 78 and the adapter member 120 between the plurality of first electrical contacts 500, 520 and that extends through a tip of the cigarette adapter of the supporting member and adapter member of the extension member, 510, 530, respectively.

As illustrated in Figs. 1 and 5-9, the present invention may be used with various models of cellular telephones, including ERICSSON® DF388vi P3 and AF778 P5 (shown in Figs. 7 and 9), NOKIA® P2 (shown in Fig. 5) and MOTOROLA® P1, P4 (shown in Figs. 1 and 8).

For example, in a first aspect of the present invention, as illustrated in Fig. 1, 2(a)-(b) and 3(a)-(b), the main body 20

comprises a head 200 and a base 210. The telephone cradle 40 is substantially centrally located within the main body 20, between the head 200 and the base 210 of the main body 20. The telephone cradle 40 comprises a top receiving end 230 and a bottom receiving end 240. In a first aspect of the present invention, for use with, for example a MOTOROLA® StarTac cellular telephone P1 (shown in Fig. 1), the speaker 30 is positioned on the head 200 of the main body 20 substantially adjacent to the top receiving end 230 of the telephone cradle 40. The microphone 60 is located on the base 210 of the main body 20, substantially adjacent to the bottom receiving end 240 of the telephone cradle 40. Additionally, the volume control 94 for the speaker 30 is substantially centrally positioned on the base 210 of the main body 20, substantially adjacent to the top receiving end 230 of the telephone cradle 40. The securing means for securing the telephone to the telephone cradle 40 comprises a pair of opposite arms 260 positioned on the main body 20 substantially adjacent to the top receiving end 230 of the telephone cradle 40 and a seat 92 for receiving the telephone positioned on the main body 20 substantially adjacent to the bottom receiving end 240 of the telephone cradle 40.

Alternatively, in a second aspect of the present invention, as shown in Fig. 5, 6(a) and 6(b), the apparatus designated generally as 12, which may be used, for example with NOKIA® cellular telephone P2, comprises a main body 20 with a front 300, comprising a front-head 310, and a front-base 320, and a back 400, comprising a back-head 410 and a back-base 420. The front 300 and back 400 of the main body 20 are attached by a right panel 330 and a left panel 340. The telephone cradle 40 is substantially centrally positioned between the front-head 310 and the front-base 320. The speaker 30 is positioned on the back 400 of the main body 20 substantially adjacent to the back-head. The microphone 60 is substantially centrally positioned on the front-base 320 of the main body 20. The securing means for securing the telephone to the

telephone cradle 40 comprises a set of extruding side panels formed by the right and left panels 330, 340 respectively, and a seat 92 for receiving the telephone. The volume control 94 for the speaker 30 is positioned on the right side panel 330 of the main body 20.

5 Accordingly, it will be understood that the preferred embodiment of the present invention has been disclosed by way of example and that other modifications and alterations may occur to those skilled in the art without departing from the scope and spirit of the appended claims.

CLAIMS

1. Apparatus for permitting the hands-free use of a cellular telephone while driving a vehicle, which apparatus comprises a main body (20) for receiving the cellular telephone comprising a telephone cradle (40), a microphone (60) and a speaker (30), a supporting member (70) for supporting the apparatus characterised in that the supporting member comprises a first end (72) affixed to the main body (20) and a second end (76) comprising a cigarette lighter adapter (80), allowing for a power supply to the main body (20) through the supporting member when plugged into a fitting for a cigarette lighter in a vehicle; and securing means (90-92) for securing the telephone to the telephone cradle (40).

2. Apparatus according to claim 1, characterised in that the main body (20), in particular the telephone cradle (40), comprises a charging unit (50) for the cellular telephone.

3. Apparatus according to claim 1 or 2, characterised in that the main body comprises a microphone and a speaker and connecting means for establishing an electrical connection between on the one hand, the microphone and the speaker and on the other hand the telephone placed into the apparatus, whereby means are provided for transmitting signals received by the microphone to the cellular telephone and signals received by the telephone to the speaker.

4. Apparatus according to any of claims 1 - 3, characterised in that the securing means comprise a seat (92) for receiving the telephone.

5. Apparatus according to any of claims 1 - 4, characterised in that the securing means comprise a pair of opposite extruding side panels (90, 330-340) affixed to the main body (20).

6. Apparatus according to any of claims 1 - 5, characterised in that the main body (20) comprises an upright directed body with a head (200) and a base (210), whereby the telephone cradle (40) is substantially centrally located within the main body (20), between

the head (200) and the base (210), and the telephone cradle (40) comprises a top receiving end (230) and a bottom receiving end (240).

5 7. Apparatus according to any of claims 2 - 6, characterised in that the charging unit (50) is located substantially adjacent to the bottom receiving end (240) of the telephone cradle (40).

8. Apparatus according to any of claims 6 - 7, characterised in that the microphone (60) is located at the base (210) of the main body (20), substantially adjacent to the bottom receiving end of the telephone cradle (40).

10 9. Apparatus according to any of claims 6 - 8, characterised in that the speaker (30) is positioned on the head (200) of the main body (20), substantially adjacent to the top receiving end (230) of the telephone cradle (40).

15 10. Apparatus according to any of claims 1 to 9, characterised in that the speaker (30) is positioned on the back of the main body (20).

11. Apparatus according to any of claims 1 - 10, characterised in that the apparatus comprises a pivot hold (74) to adjust the position of the main body (20).

20 12. Apparatus according to any of claims 1 - 11, characterised in that it comprises an extension member (100) co-operating with the supporting member (70).

25 13. Apparatus according to claim 11, characterised in that the extension member (100) has one end which can be removably attached to the second end (76) of the supporting member (70) and an opposite end comprising a cigarette lighter adapter (120), which can be plugged into a fitting for a cigarette lighter of the vehicle, allowing for a power supply via the extension member (100) to the main body (20).

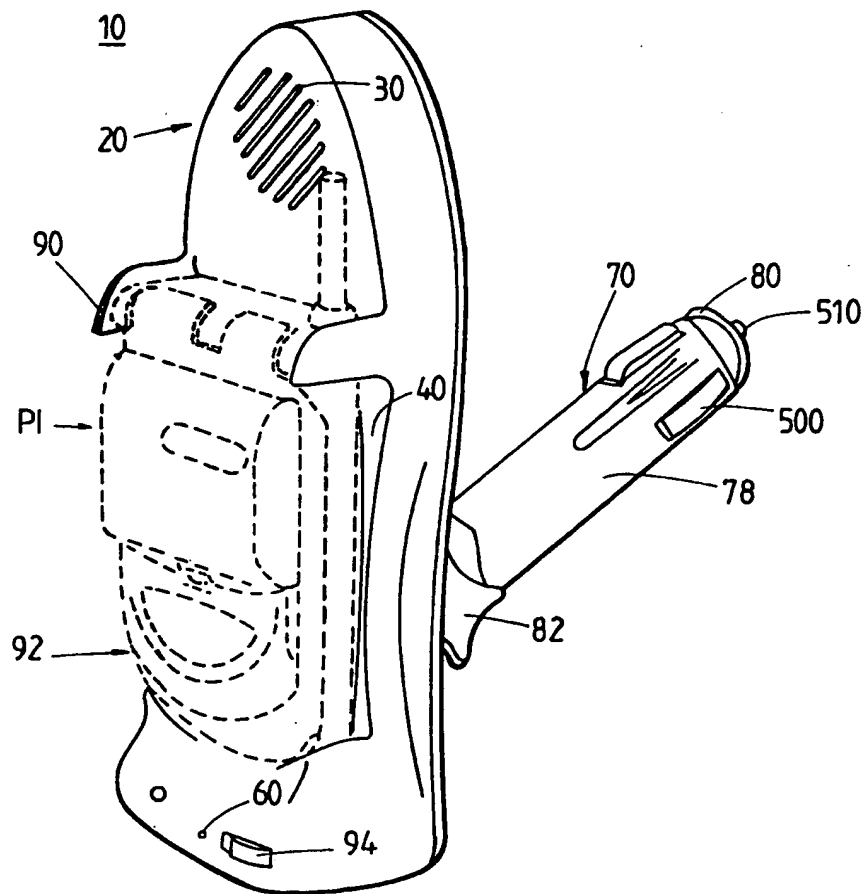


Fig. 1

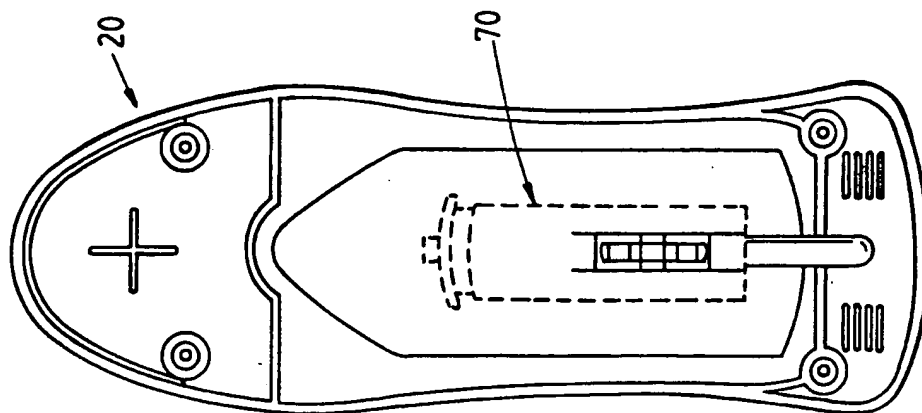


Fig. 2B

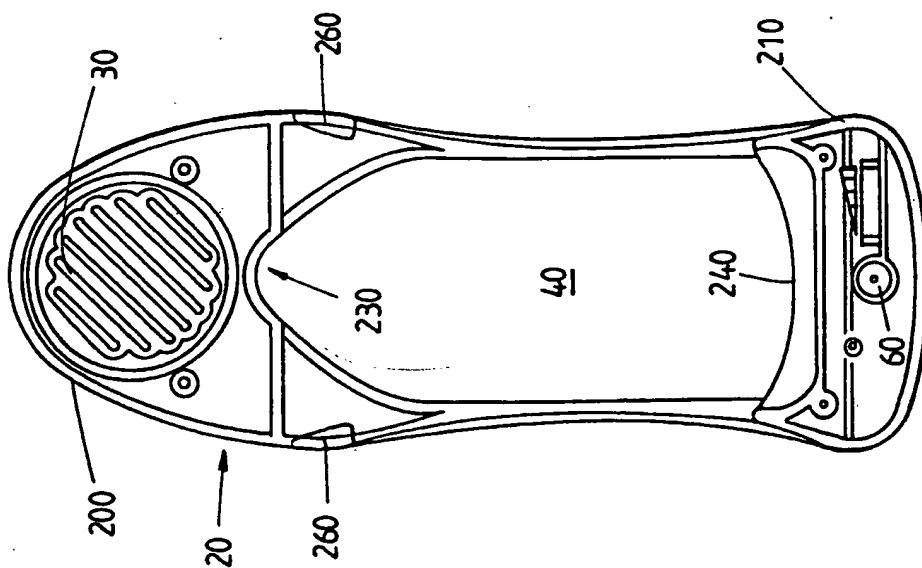


Fig. 2A

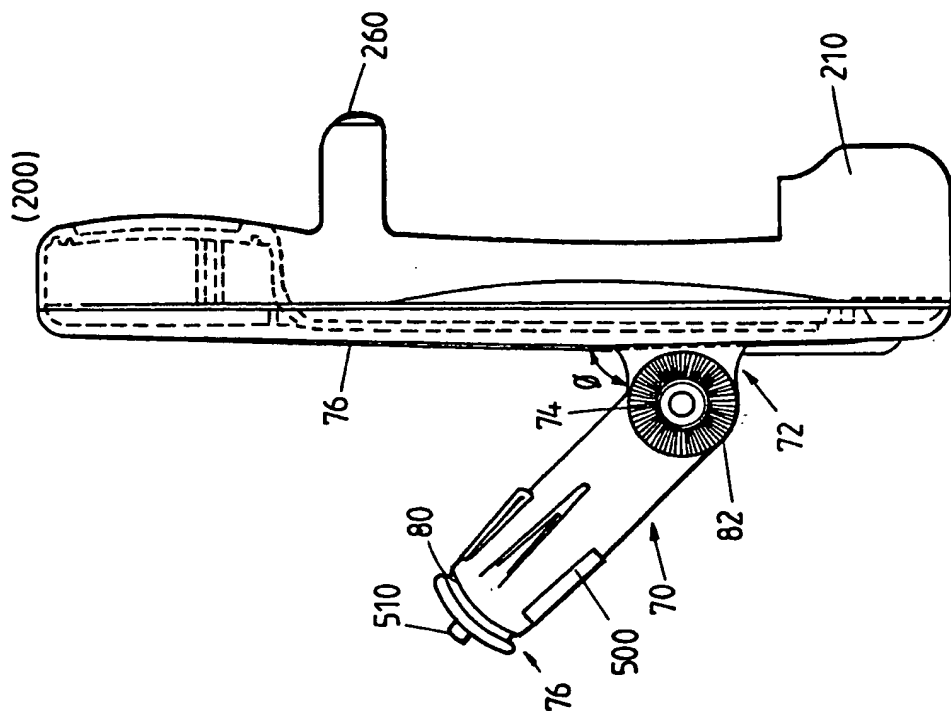


Fig. 3B

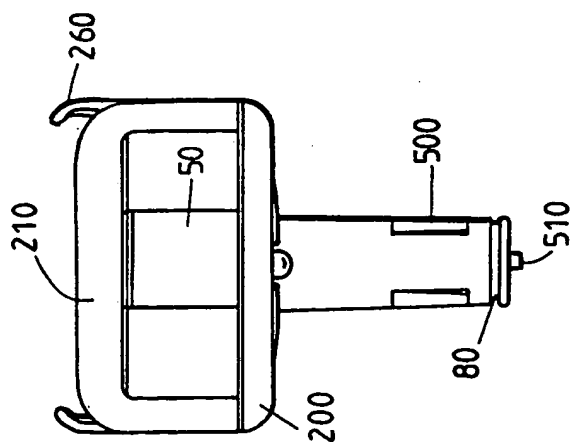


Fig. 3A

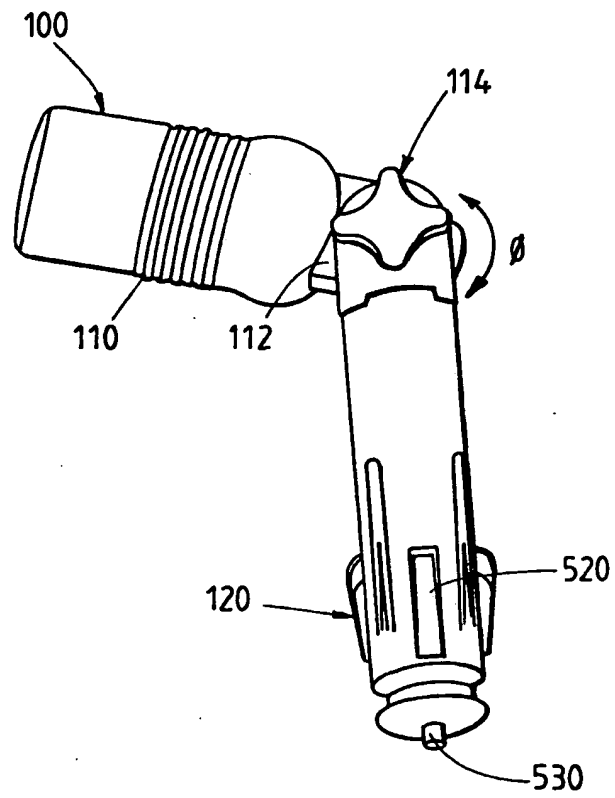


Fig. 4

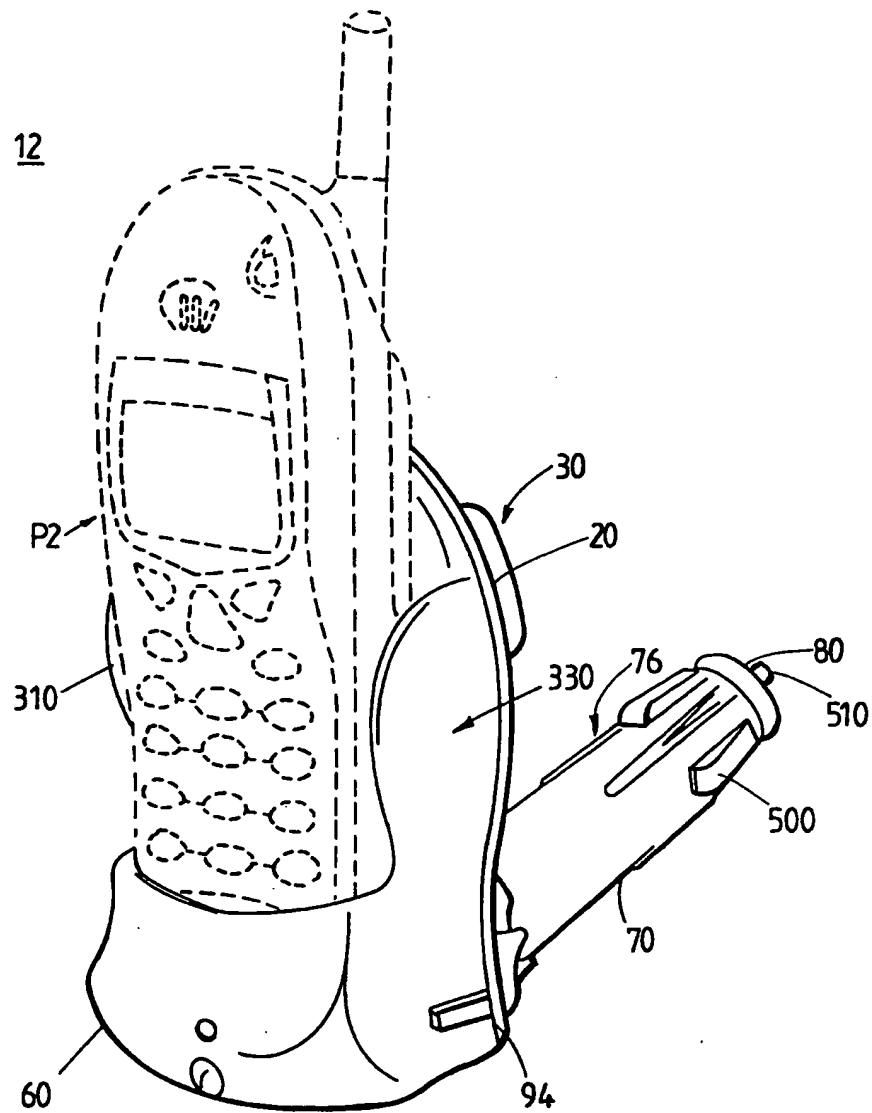


Fig. 5

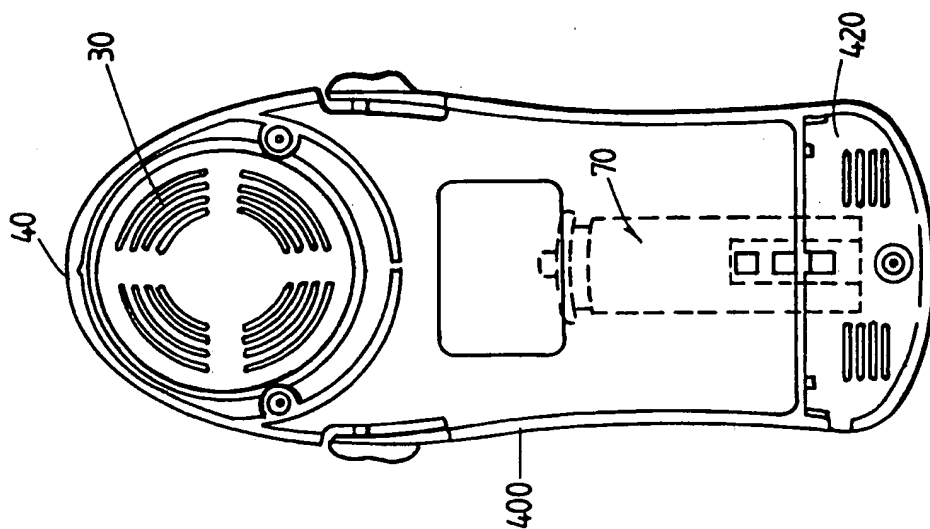


Fig. 6B

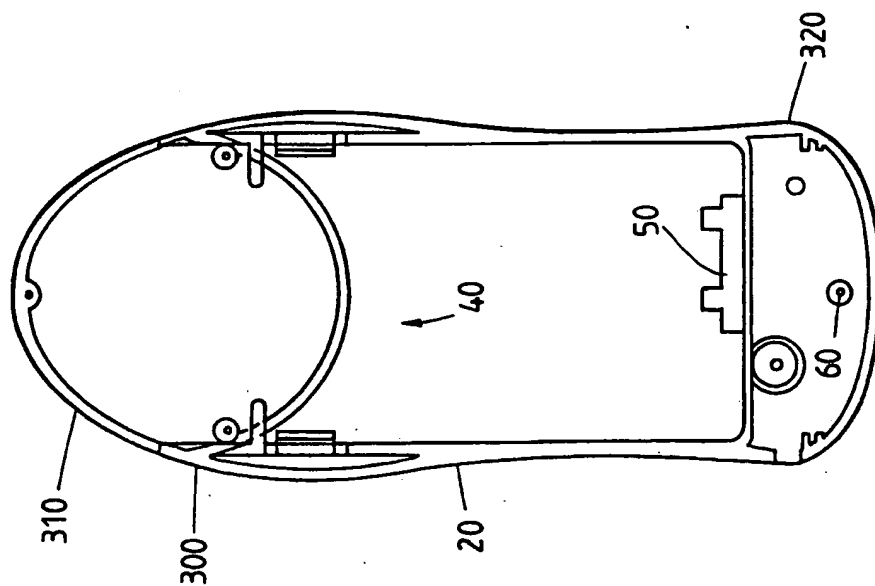
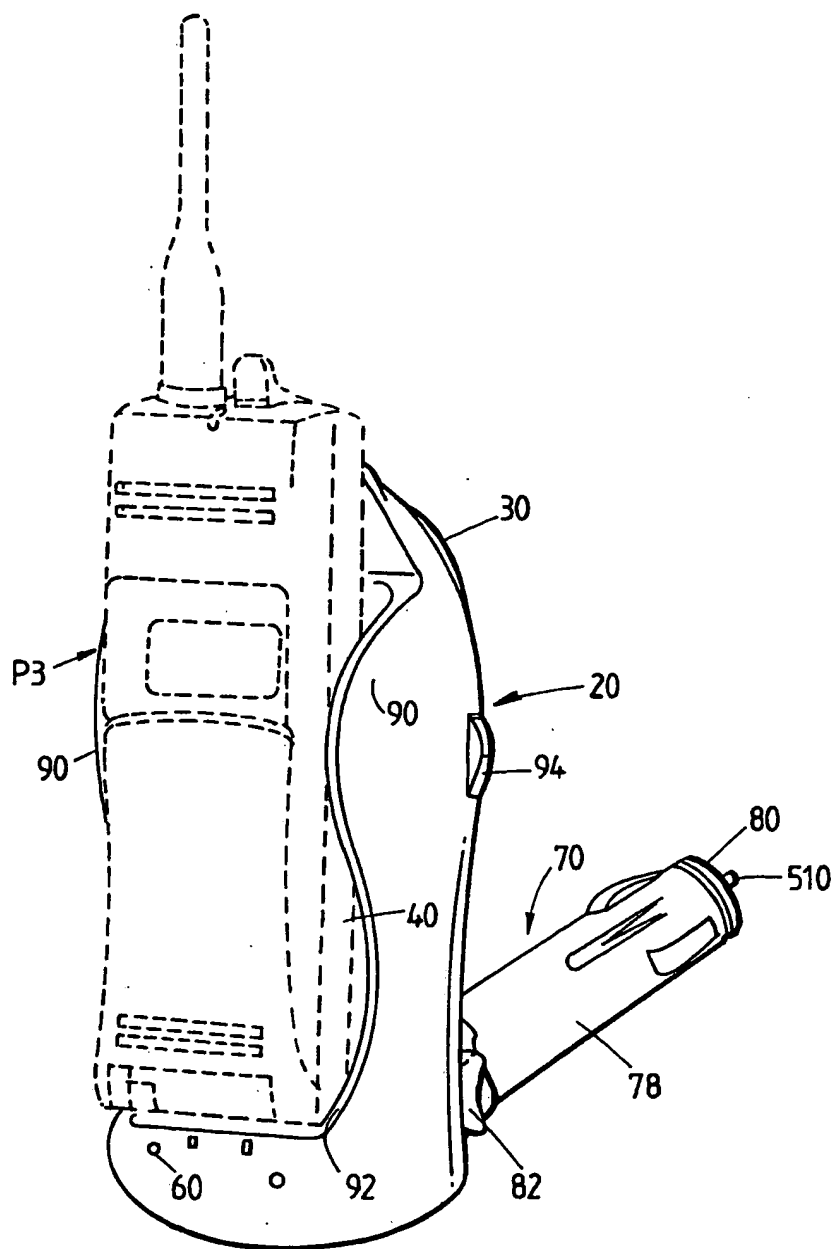


Fig. 6A

**Fig. 7**

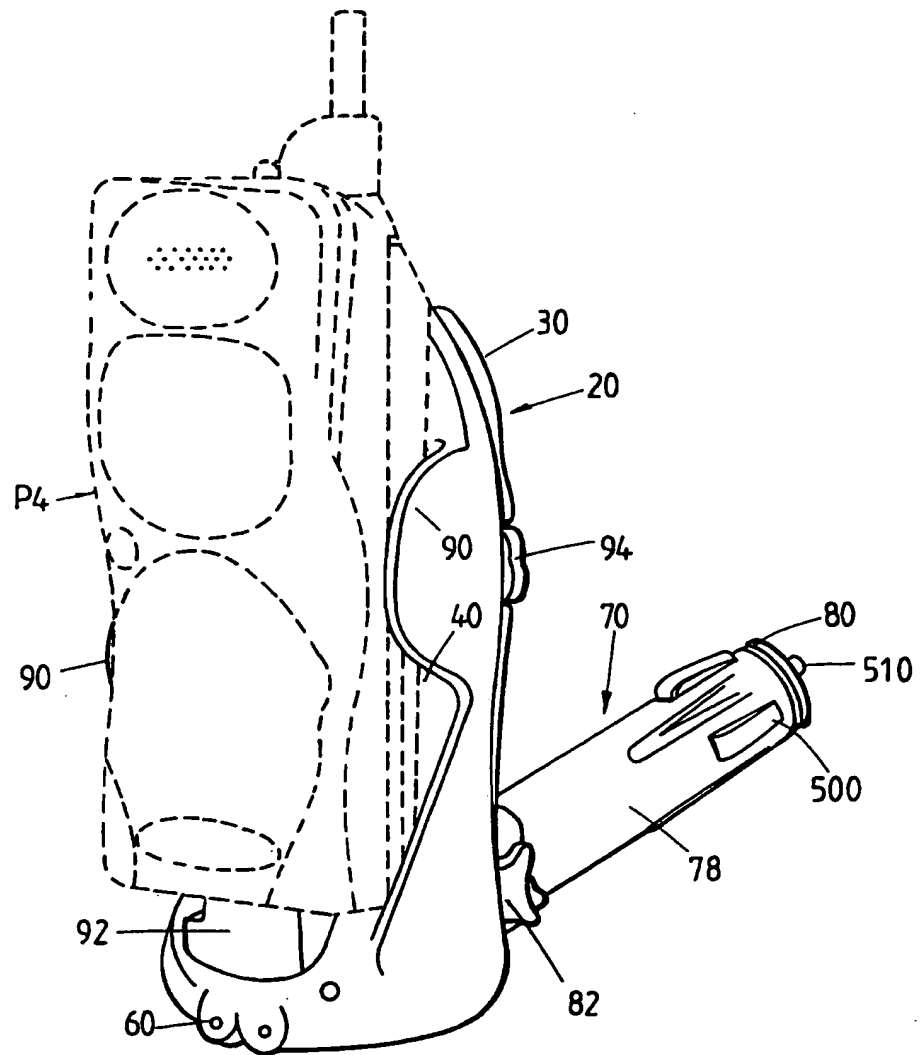
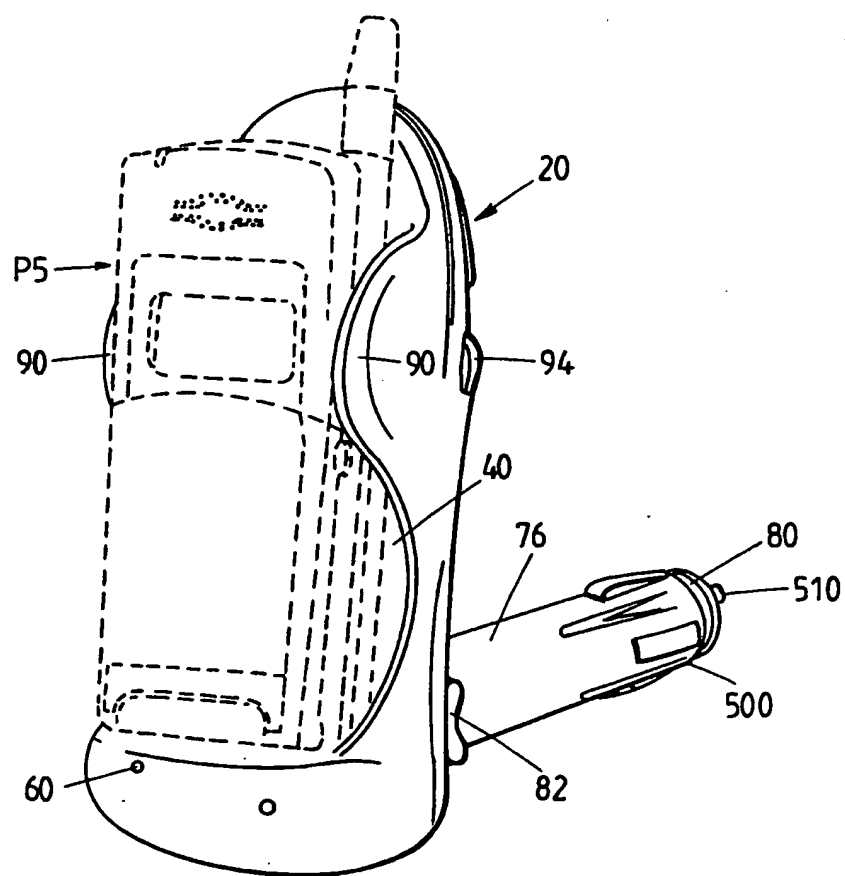


Fig. 8

**Fig. 9**

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 99/01526

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B60R11/02 H04M1/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04M B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 94 22234 A (PROFINOR SA ;LEVI EDMOND (CH); SCHAFFER RUDOLF (CH)) 29 September 1994 (1994-09-29) page 13, line 27 -page 15, line 1; figure 4	1-5
A	---	6,8,9
Y	US 5 414 770 A (WANG FORE S) 9 May 1995 (1995-05-09) claim 1; figure 2	1-5
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A	WO 96 32783 A (MOLD TECH PLASTICS LIMITED PAR) 17 October 1996 (1996-10-17) page 7, line 15-32; figures 2A,2B,2C,2D page 8, line 14-20 page 10, line 8 -page 11, line 6; figure 3 ---	1-5
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 99/01526

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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